Space Weather Forecast

Issued on Saturday 30 November 2024 at 12:33 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Low to Moderate Activity. Slight potential for a G1/Minor Geomagnetic Storm interval Day 3 or Day 4.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low during the past 24 hours, with only a high-level Common-class flare observed at 30/0906 UTC originating from the two largest and most complex sunspot regions located in the southwest quadrant. Although these regions have been largely inactive. A sunspot region located near the east limb may be one or two separate regions. The remaining regions are generally smaller and simpler, with no significant growth or decay observed.

No Earth-directed coronal mass ejections (CMEs) were observed during the past 24 hours.

Solar Wind / Geomagnetic Activity: Solar winds have been slightly elevated to background, ranging between 360 and 420km/s. Total magnetic field strength has been moderate throughout. The north-south component Bz, has varied between negative (southward) and positive (northward) orientation, although has recently remained steady and mostly positive (northward) since 30/0400 UTC. Geomagnetic activity was Quiet to Unsettled (Kp1-3), with a provisionally G1/Minor Storm (Kp5) observed at 29/0000-0300UTC, possibly due to a weak transient CME feature, although the source of this is currently unknown.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background with no solar radiation storms occurring.

Four-Day Space Weather Forecast Summary

Solar Activity: Low to Moderate activity is expected with a chance of isolated Moderate-class flares. There is a very slight chance of isolated Strong flares.

Solar Wind / Geomagnetic Activity: A coronal mass ejection (CME) seen leaving the Sun on 27 Nov is forecast to arrive on Day 3 (02 Dec), or possibly Day 4 (03 Dec). This CME is forecast to either miss or glance the Earth, giving limited impacts. Solar winds are expected to remain at, or close to, slow-ambient levels throughout with coronal hole influence on Day 3 expected to be minimal.

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Geomagnetic activity is expected to be mostly Quiet to Unsettled (Kp 1-3), although there is a chance of the glancing blow CME arrival producing Active (Kp 4) intervals, possibly peaking at G1/Minor Geomagnetic Storm (Kp 5) levels although this is considered a low likelihood.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to remain at background levels with only a slight chance of solar radiation storms occurring.

Geomagnetic Storms

Geomagnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	1	20	10
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 (M Class)	No	40	40	40	40
Very Active	R3-R5 (X Class)	No	5	5	5	5

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Solar Radiation Storms (High Energy Protons)

Radiation Storms Probability (Exceedance)	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**≥ S1**	No	15	15	15	15
Very Active	**≥ S3 ***	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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